OHIO'S ENGINEERING FIRSTS

By GEORGE S. BONN

6. ROADS, MAPS, AND THINGS

ROADS are funny things. They seem to go everywhere, yet they always lie still. They carry commerce from one state to another, yet no court ever accused them of dealing in interstate commerce. They direct, guide, and lead people into all sorts of situations. (John Masefield says that they *lure* him, but maybe he means country roads.) Our modern roads do things like these. The old roads did much more; they built the country, they built the cities, and they built the nation. The one old road that had perhaps more to do with the building of the West than any other, went right through the middle of Ohio on its way from the Potomac to the Mississippi. In fact, this old National Road had more miles completed in Ohio than in all the other states combined. The present U. S. 40 follows the same route from St. Louis to Cumberland, Md.

Earliest Trails

Putting a road down through a wilderness is not such a simple thing to do. So the old road builders looked around for animal or Indian trails to follow (after they got rid of the animals and Indians, of course.) It seems the buffaloes were among the best trail blazers because they were so heavy and so fast that the trails they used had to be solid, safe, and short. There were three main buffalo routes from the east. One went through northern New York to the lakes, about the way the New York Central railroad goes now. Another went through southern Virginia between the Alleghanies and Blue Ridges and into Kentucky through Cumberland Gap. This, the Wilderness Road, was first marked for the white men by Daniel Boone.

The third way led up to the Potomac and then to the Ohio at about Pittsburgh. This is the one that eventually became, with modifications, the old National Road. While it had been used for centuries, it was not "marked" until about 1749. It was this route that Washington traveled on some of his western expeditions. It was up this way that General Braddock came in 1755 to capture Fort Duquesne, and got himself ambushed instead. Braddock made his own road, 12 feet wide, to the point where the city of Braddock, Pa., now stands and where his band was annihilated.

Braddock's Road, as it was called, was used by just the few people who took the trouble to push their way through to one of the tributaries of the Ohio so that they could go by water into Kentucky. Most of the people used the Wilderness Road instead. However, when Congress in 1802 passed an act enabling the people of Ohio to form a state government, they decided something should be done about building a road through to the new territory. Five per cent of the proceeds from the sale of land in the new state went to the road fund. A committee was appointed, five different routes were considered, and finally the Braddock Route was chosen, to be continued to the Ohio River to a point somewhere between Steubenville and Wheeling. A long act was at once drawn up "to regulate the laying out and making a road from Cumberland, in the state of Maryland, to the state of Ohio" and was signed by President Jefferson, March 29, 1806.

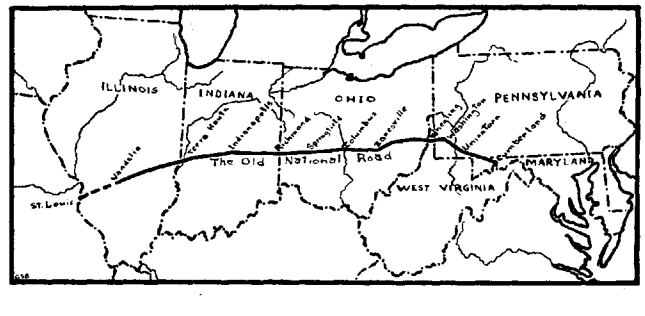
The National Road

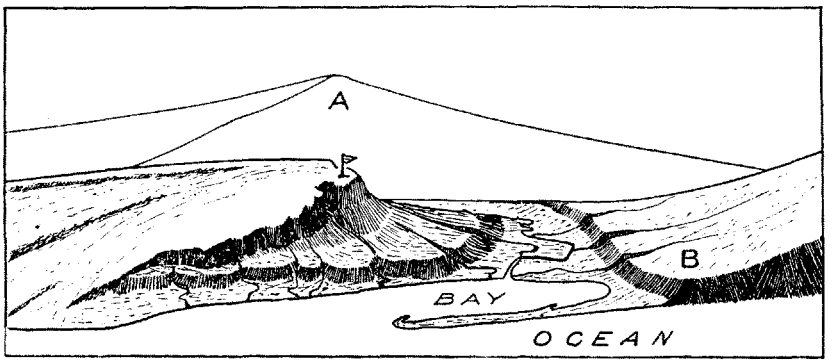
The road was laid out in the general line of Braddock's Road as far as Uniontown; from there it followed an older road to Brownsville and Washington. It came out on the Ohio at Wheeling, mostly through the efforts of Henry Clay. Contracts for the first ten miles west of Cumberland were signed in 1811, and the road was opened to Wheeling in 1818.

While the road had accomplished what it set out to do—give a passageway across the mountains to the Ohio—there was agitation to continue the road westward through Ohio; so, an appropriation was made to lay out the road from Wheeling to the Mississippi River, to go through the seats of government of Ohio, Indiana, and Illinois. By 1929 the road was open to Zanesville, and by 1833 it reached Columbus. The road, we learn, entered Columbus on Friend Street (now Main) and left the town on West Broad, going up High to make the connection, since there was so much rivalry between the north and south ends of town over the road's entrance into the city.

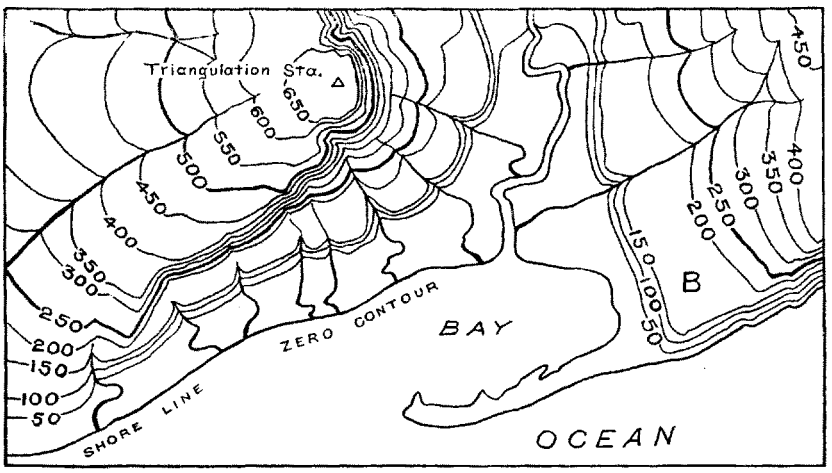
The road got to Springfield in 1837 and into In-

ROUTE OF THE OLD NATIONAL ROAD





SEMI PICTORIAL DRAWING



Courtesy Ohio Topographic Survey

CONTOUR MAP OF THE ABOVE DRAWING

diana shortly after. By 1850 it reached Illinois. The states through which the road ran took it over and continued or completed the work of the Federal government. The route had been graded and bridged as far as as Vandalia, then the capital of Illinois, when Illinois got it. Vandalia, then, is as far as the Old National Road actually went.

All during the time of the building of the road, other methods of transportation were being developed. Canals, better river boats, and railroads were coming in. In fact, even in 1836 the government seriously considered substituting a railroad for the road from Columbus to the Mississippi. However, the road was built and operated and repaired. Tolls were collected in Ohio as late as 1900, mostly for the upkeep of the road. Stage coach lines were operating from one end to the other and on side roads; taverns sprang up all along the way. The first Neil House, for example, opened in the 1820's and was for years the headquarters of the Neil, Moore and Company stage line. Mail coaches, operated by many of the stage lines, made the most official use of the road. Express mail was much faster—and there were, of course, robbers.

A very interesting account of "The Old National Road—The Historic Highway of America" appears in Vol. IX of the Ohio Archaeological and Historical Society Publications, 1901, written by Archer Butler Hulbert. It begins on page 405 and includes over a hundred pages of material, with special sections devoted to taverns, mail coaches, stage coaches, tolls, and national and state legislation.

Typographic Maps

Maps, too, are funny things. They contain an immense amount of information for the person who knows how to interpret what he sees. Some of them show where things are; some show how high things are or how deep; others show what is on top of the earth; still others show what's underneath. Ohio is particularly fortunate in having a very complete set of all sorts of maps, and it was the first of the larger states to be completely topographically surveyed.

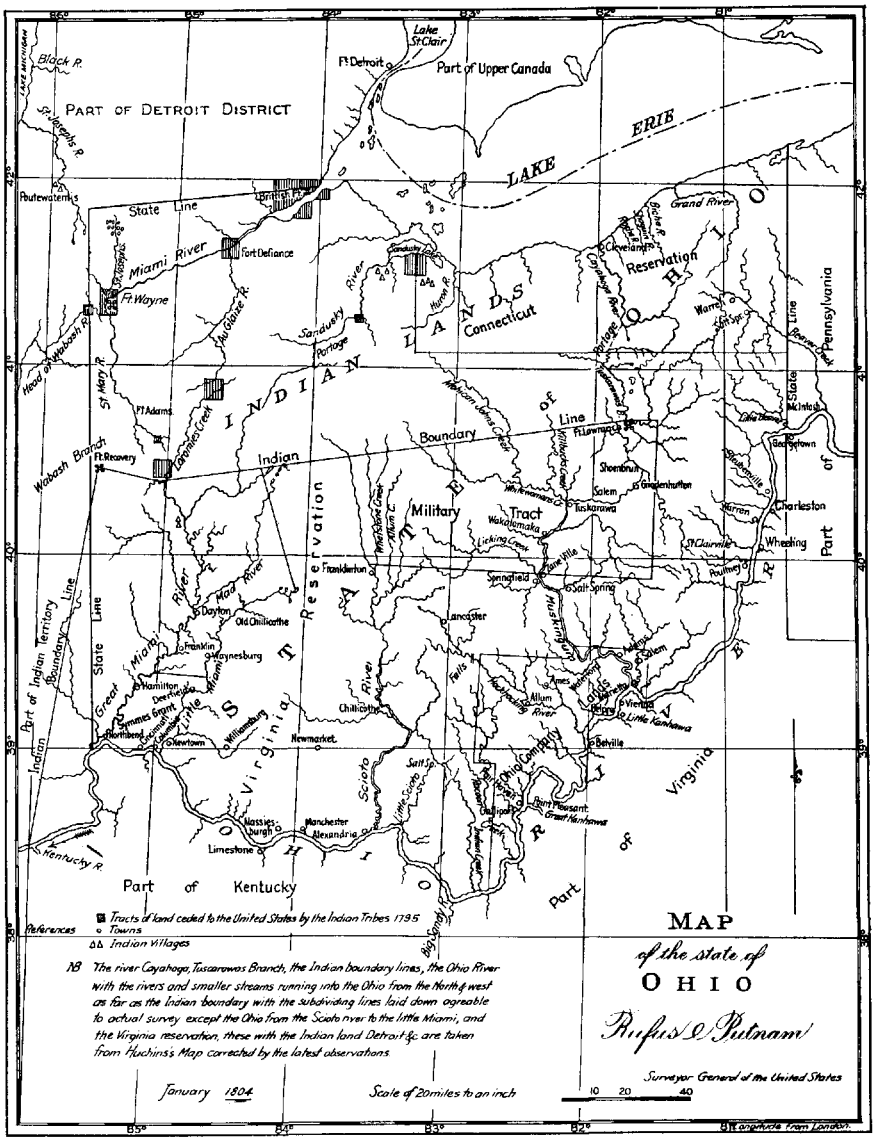
A topographic map shows the exact character of the land within its borders. All streams, ponds, roads, streets, houses, railways, towns, and boundaries are shown accurately; the hills, valleys, cliffs, ridges, and other land figurations are depicted by means of contour lines which show the extent of the surface as well as its height above sea level. Usually such maps are printed in three colors: black for all man-made features, blue for all bodies of water, and brown for relief as shown by the contour lines.

Contour lines are to the land what isotherms are to the weather. The weather bureau publishes daily maps showing all stations with the same temperature recordings connected by a line through the stations. All points on any one line have the same temperature. Similarly, all the points on any one contour line have the same height above sea level, which is marked on the line. These contour lines are so drawn that they differ from their nearest neighbor lines by a convenient height such as 10 feet, 20 feet, or 50 feet. It is therefore possible to determine just how rapidly the land rises or falls, depending on the distance between the lines. If the lines are far apart, the slope is gradual; if they are very close together the slope is steep; if there are no lines, there is no slope—it's level. Incidentally, to make it easier to read the contour lines, every fourth or fifth one is accentuated, setting it off from the others. Between the heavier lines, therefore, is indicated a rise of 50, 100, or 200 feet, or more.

The two illustrations show how a hill, for example, appears when it is drawn on a contour map. The top picture is semipictorial, indicating clearly the rises and the low land. The lower picture indicates the same thing (except the mountain *A*) with the exact heights above sea level of the land at 50-ft. intervals.

The Ohio Survey

The earliest known map of Ohio was made in 1804 by Rufus Putnam, the surveyor-general of the United States. It was simply an outline map showing various important settlements, rivers, and boundaries. The first geological survey of the state was begun in 1837 but is came to an abrupt end in 1839 making no provision for the preservation of the notes, papers, or maps. Other maps were of varying degrees of accuracy until 1901 when the Ohio topographic survey was started. When it was finished in 1916, the state had the largest map it ever had—or probably will have, about 20 feet square. Of course, the map is printed in sections, 204 in all, to cover the entire state. The scale is approximately one mile to one inch. (Exactly, it is 1:62,500 inches.)



Courtesy Ohio Topographic Survey

FIRST MAP OF THE STATE OF OHIO—1804

In 1879 the United States Geological Survey was organized to study and map the geologic structure and mineral resources of the country. Maps were important parts of the survey, so a separate branch, topographic, was set up in 1899 to take care of them. The Ohio Academy of Science, among others, urged the 1898 legislature of Ohio to provide funds for a cooperative survey of the state, much the same as had been previously carried on in a few of the eastern states. The USGS completed eight sections of the state at its own expense to show the worth of such maps. After a little more coaxing the legislature made an appropriation available in 1901 to start the work in Ohio.

So the Ohio Topographic Survey came into being, under the direction of Professor Christopher E. Sherman of the department of civil engineering here at Ohio State. Since it was a cooperative project, the Federal government helped in the cost, dollar for dollar. The project was completed in 1916; the only other states finished at that time were Connecticut, Maryland, Massachusetts, New Jersey, Rhode Island, and the District of Columbia, so Ohio was by far the largest of the group. Even in 1929 there were only ten states completely mapped. Incidentally the total cost of the survey here in Ohio was only $15.15 per square mile, almost $4 less per square mile than any other state. On top of that, the state has the most complete set of reports on the work published by any of the states; Professor Sherman did those, too.

It is indeed unfortunate that sample maps cannot be published in the magazine because it would require three-color printing which is expensive (it's bad enough to get one-color printing done.) However, everybody should become acquainted with the "topo maps" and learn to use them. They are, for example, excellent road maps, showing the kinds of roads as well as the elevations. They are available in sections at most book stores.

The reports of Professor Sherman, four volumes of them, are worth while from a historical viewpoint, besides the data they contain on the actual topographic surveying. All sections of the state are treated in detail with respect to their earliest laying out and settling and there are numerous illustrations showing the locations of many of the spots discussed.